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ABSTRACT

An elementary science program was taught in Spanish for English-speaking children to give them the opportunity to acquire second language skills through hands-on science instruction. The program included 4 classes of approximately 22 students at kindergarten and first-grade levels in the gifted and talented program at the Gary Herod Elementary School (Texas). Staff development and parent involvement were major components of the program, which has been planned to expand as students advance each year until all grades participate. A comparison with baseline data on student performance in Spanish and science indicated that students progressed beyond expectations in both science and Spanish language skills. On the Spanish assessment in May, kindergarten students appeared to be functioning approximately at age level. Survey information from students, parents, and teachers indicated that the majority were in favor of the program and the initial implementation outcomes. Six appendixes present the project newsletter and forms used in program evaluation, including surveys. (Contains one figure and five tables.) (SLD)

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RESEARCH

Report on Educational Grants

An Evaluation Report from the Department of Research and Evaluation

Ciencias en Español

1995-96

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EXECUTIVE SUMMARY

CIENCIAS EN ESPAÑOL 1995-96

Program Description

In September 1995, Gary Herod Elementary School in the Houston Independent School District (HISD) received a Title VII Foreign Language grant from the Office of Bilingual Education and Minority Language Affairs (OBEMLA) at the U.S. Department of Education. This was to fund an elementary science program taught in Spanish for primarily English-speaking children.

The *Ciencias en Español* program was initiated within the Gifted and Talented program and included four classes of approximately twenty-two students on the kindergarten and first grade level. As envisioned, each academic year one grade level will be added to those continuing in the program, until an immersion-based developmental foreign language program, from kindergarten through fifth grade exists at Herod Elementary School.

In the fall of 1995, the *Ciencias en Español* teacher began collaboration with the classroom teachers in planning the science lessons for the spring semester and weekly collaboration continued through the school year. The purpose of the teacher collaboration was to provide time for teachers to interact so skills and concepts taught in the regular classroom during the first semester could be expanded and reinforced throughout the spring semester. In December, the students were pre-assessed to determine their fluency in Spanish. From January through May, student attended the *Ciencias en Español* class, Monday through Thursday for a 45-minute class session. Students were again assessed using the same instrument in May. Science achievement was measured by the classroom teachers and the *Ciencias en Español* teacher in relation to Texas Essential Elements as reported on the Primary Progress Report.

The goals for *Ciencias en Español* were integrated into the academic, social emotional needs of the Gifted and Talented students within the school community. The instructional goals of the program as stated in the grant were to provide primarily English-

speaking students a rich language learning environment to assist them in Spanish language acquisition, using content-based language immersion. In conjunction and of equal importance, the program was to provide these students a rich science experience by designing and equipping an elementary laboratory and introducing them to hands-on, experimental science instruction. To do this more effectively, staff development and parent involvement were addressed as major components of the program. The goals, then defined as objectives determined implementation.

Over the three years, students are expected to demonstrate basic communicative skills in the Spanish language and appreciation of the Spanish language. This means that each year students should move toward communicative competency in Spanish. The first year, this required building a receptive Spanish language vocabulary based on the instructional context.

Over the same time, the students are expected to demonstrate grade level mastery of science concepts. Each year students move toward greater awareness of the scientific nature of their environment. At the end of three years in the program, students are expected to demonstrate mastery of grade level essential elements of science as outlined in the HISD curriculum.

The goal of this evaluation report was to describe the implementation of the program at Herod Elementary and provide base line data on the students in the program. As this program is part of a three-year effort, findings reported in this evaluation will be assessed in terms of the progress being made toward the program's long term goals for its participants. The following research questions were addressed:

1. What were the demographic characteristics of the program participants?
2. How did *Ciencias en Español* affect the academic progress of students in the program? What

oral language skills in Spanish did students demonstrate during the first year? What science skills did the students demonstrate at the end of the 1995-96 school year?

3. To what extent did program staff participate in the program training?
4. How were parents involved in the program and what were their perceptions of the program?
5. What were the perceptions of school personnel about effectiveness and what recommendations did they make to improve the program?

Findings

- Approximately 74 Gifted and Talented students in kindergarten and first grade at Gary L. Herod Elementary School participated in *Ciencias en Español*, an innovative science class taught in Spanish in 1995-96.
- During 1995-96, the total group was almost equally apportioned by gender with a slightly higher percentage (51%) of the students being male. All the students were fluent in English with one student fluent in both English and Spanish.
- The students baseline score on a Spanish version of the Peabody Vocabulary Test (TVIP) indicated on average, a functional level in Spanish at about a two to three year old level.
- On the same measure in May, students performed at about a five and a half year old level in terms of understanding Spanish vocabulary. For the kindergarten, it meant that on average, students were able to process information delivered in Spanish almost at the expected grade level. First grade students also showed progress in understanding Spanish, and on average they enter Second grade with receptive Spanish language acquisition skills of beginning first graders.
- Teachers rated progress on the science learned in relation to the Texas Essential Elements and the Primary Progress Report. On the Primary Progress Report, 39 students or 54% progressed two developmental levels.
- On a survey designed for the students and their parents and teachers, the majority agreed that the students enjoyed and learned both science and Spanish in the *Ciencias en Español* program.
- On the survey, teachers and parents pointed to communication between school and home as an area needing improvement. Specifically this referred to the ways in which parents could assist students learning both Spanish vocabulary and science concepts.

Recommendations

1. To create an environment that fosters immersion in Spanish, the number of Spanish-speaking students in the *Ciencias en Español* classes should be increased.
2. Based on teacher comments on the survey and classroom observations it would seem advisable to provide more time for integration of instruction between the *Ciencias* laboratory teacher and the classroom teacher. One way of doing this would be to have the classroom teacher remain with the students in the *Ciencias* lab for part of their instructional time and then have the *Ciencias* teacher spend time in the regular classroom.
3. Regular communication with program parents should emphasize student performance. Parents should be provided with available, objective level data regarding students' performance.
4. The need for ongoing assessment and the development of adequate tools to accurately measure growth in both science and in Spanish language acquisition should be addressed either in finding or devising useful assessment tools.
5. Parent concerns, staff support and the planning needed to promote community interaction reflect the need for a program director apart from the role of teacher, as stated in the original grant proposal.
6. Adult Spanish classes are needed, at varying times to meet the parents' schedules. The class should be tailored to provide vocabulary and skills to enhance their child's learning environment.

CIENCIAS EN ESPAÑOL 1995-96

In September 1995 Gary Herod Elementary School in the Houston Independent School District (HISD) received a Title VII Foreign Language grant from the Office of Bilingual Education and Minority Language Affairs (OBEMLA) at the U.S. Department of Education. The grant funded an elementary science program taught in Spanish for English-speaking children. Ciencias en Español was designed to provide primarily English-speaking students, opportunity to acquire second language skills, through hands-on, experiential, science instruction. The Ciencias en Español program included four classes of approximately twenty-two students on the kindergarten and first grade level enrolled in the Gifted and Talented program at Herod Elementary school. This report describes the program and the first year of implementation. Baseline data on student performance in Spanish and science indicated that students progressed beyond expectations in both science and in Spanish language skills. On the Spanish assessment in May, kindergarten students appeared to be functioning approximately at age level. Survey information from students, parents and teachers indicated that the majority were in favor of the program and the initial implementation outcomes.

Introduction

In September 1995, Gary Herod Elementary School in the Houston Independent School District (HISD) received a Title VII Foreign Language grant from the Office of Bilingual Education and Minority Language Affairs (OBEMLA) at the U.S. Department of Education. The grant funded an elementary science program taught in Spanish for primarily English-speaking children who qualified for the Gifted and Talented program.

The ethnic composition of the district during the 1995-96 school year was 51% Hispanic. Throughout the district, 8.2% of the total student population participated in the Gifted and Talented program. Gary L. Herod Elementary School also received grants for their implementation of a dual-language, bilingual program to integrate LEP students into the school environment.

Program Description

Ciencias en Español was designed to provide primarily English-speaking students, an opportunity to acquire second language skills through a hands-on, experiential, science instruction. The *Ciencias en Español* program included four classes of approximately twenty-two students on the kindergarten and first grade level from the Gifted and Talented Van-

guard population. The program was designed to add one grade level each academic year until an immersion-based, developmental, foreign language program from Kindergarten through fifth grade exists at Herod Elementary School.

Program History

The *Ciencias en Español* program evolved in response to parents suggestions, long range school goals and staff initiative. On a survey, parents of children in the Gifted and Talented Magnet program expressed interest in upgrading science instruction on the elementary level. Another reported concern was that although their children were attending a Spanish class twice a week, using a traditional foreign language approach, they did not appear to be learning much Spanish. The Herod administrative staff, considered these concerns, reviewed them as goals and designed a program to meet the expressed need. The result was an innovative program providing students a content-specific class in a enriched, Spanish language environment.

Ciencias en Español was initiated in September 1995 with the major funding provided from a Bilingual Education Foreign language Assistance Program grant. As part of the HISD in-kind contribution, a portable building was brought to the Herod campus

and outfitted with needed laboratory equipment.

By October, both a teacher and an instructional aide had been hired for the 1995-96 school year. Additional science equipment and instructional materials were ordered. The *Ciencias en Español* teacher began collaboration with the classroom teachers in planning science lessons for the second semester that would build on information taught during the first semester. In December, the students were pre-assessed to determine their Spanish proficiency. The first grade students had studied Spanish during the previous school year, but the kindergarten students had not previously received formal instruction in Spanish. From January through May, students attended the *Ciencias en Español* class, Monday through Thursday for a 45-minute class session. At the end of the semester, students were again assessed in Spanish using the same instrument. Science achievement was measured by the classroom teacher and the *Ciencias en Español* teacher in relation to the Texas Essential Elements as reported on the Primary Progress Report.

Program Goals and Objectives

The goals for *Ciencias en Español* were integrated into the academic, social emotional needs of the Gifted and Talented students within the school community. The primary instructional goals of the program as stated in the grant were to provide primarily English-speaking students a rich language learning environment to assist them in learning the Spanish language using content-based language immersion. In conjunction and of equal importance, the program was to provide these students a rich science experience by designing and equipping an elementary laboratory and introducing them to hands-on, experimental science instruction. To do this more effectively, staff development and parent involvement were addressed as major components of the program. The program goals, then defined as objectives determined program implementation.

Over the three years students are expected to demonstrate basic communicative skills in the Spanish language and appreciation of the Spanish language. This means that each year students should move toward communicative competency in Spanish. The first year, this required building a receptive Spanish language vocabulary based on the instructional context.

Over the same time, the students are expected to demonstrate grade level mastery in science. Each

year students move toward greater awareness of the scientific nature of their environment. At the end of three years in the program, students are expected to demonstrate mastery of grade level essential elements of science as outlined in the HISD curriculum.

To facilitate student growth, provisions were made so that instructional staff would be offered opportunities for participation in training to improve their skills in speaking Spanish and teaching Science. During the first year, teacher training included collaboration on science units, planning for the following year and a one week intensive course on Spanish for adults. Over the three years, teachers are encouraged to pursue professional growth activities in these areas with time and resources provided.

As partners in their children's education the parents of students in the program were also addressed in the program goals. As written in the grant, this meant that parents would be encouraged to participate in activities toward greater involvement in their children's education. Provisions for parent participation were assigned to specific areas including Spanish instruction for adults, participation in workshops directed toward making instructional materials, interaction with primarily Spanish parents in the Dual Language program, participation in student activities and field trips and providing resource information about opportunities available within the Houston community. During the first year, parent opportunities included Spanish language lessons, parent "Make and Take" workshops, parent meetings and opportunity to serve on the *Ciencias en Español* Parent Advisory Board. Over the next three years, the Parent Advisory Board is expected to coordinate opportunities for parent involvement activities directed at enhancing the students' learning process.

Instructional Implementation

During the first year of its implementation, the program consisted of two kindergarten and two first grade classes of students from the Gifted and Talented program. Each year the two classes will advance to the next level and two will be added until there are two class in each of the grades from kindergarten through fifth grade participating in the program. All the students placed in the program remained through the 1995-96 school year. Aside from normal attrition, these students will continue to participate in the program through the next three years.

During the first year, or the initial phase of the program, the students went to the *Ciencias* lab for

science instruction taught in Spanish, Monday through Thursday for a 45-minute class period. Classroom teachers incorporated concepts in their center activities, as well as in additional group activities.

To enhance the student's immersion in the second language, the teacher with the assistance of an aide, conducted the class using careful repetition, simple sentence structure and slower speech rate along with rephrasing and constant checking for comprehension. See Appendix B for the weekly schedule of *Ciencias en Español* classes during 1995-96.

Program Personnel

During the 1995-96 school year, in addition to the classroom teachers, the program included the *Ciencias* teacher, an instructional aide and the Magnet Coordinator for the Gifted and Talented program (GT). The participating classroom teachers had extensive experience teaching various populations of students (7-20 years). The project Director brought expertise in working with parents as a teacher and Magnet Coordinator for children in the Gifted and Talented (GT) program.

The Spanish bilingual science teacher/ project Coordinator began her career as a Music teacher and later earned her Master of Science degree from the University of Houston in Bilingual Education. She has been certified as a Bilingual Elementary level teacher and has worked with a variety of student populations within the Houston Independent School District. Appendix C contains a more thorough description of staff qualifications and accomplishments.

Specifications of the grant included two areas that were eliminated due to limited funding. One of these was the use of a Spanish-speaking Physical Education instructor intended to provide opportunities for students to learn Spanish in conjunction with physical activities. The other was a position for a full-time program director. Instead, the *Ciencias en Español* teacher has performed a dual role to teaching and completing the administrative duties associated with the program. As project Director, the GT Coordinator provided assistance and support particularly with the parents in the program.

Program Funding

As part of an ongoing plan to provide educational opportunities for the students of Herod Elementary school, parents, teachers and administrators have joined in an effort to provide funding for the transition from traditional to innovative. The school received a

first-year grant of \$105,083, with HISD in-kind contributions totaling \$196,346 for 1995-96. Through May 30, 1996, the total amount of direct expenses for the *Ciencias en Español* was \$46,768.56.

Evaluation Goals and Research Questions

The goal of this evaluation report was to describe the implementation of the *Ciencias en Español* and provide baseline data on the students in the program. As this program is part of a three-year effort, findings reported in this evaluation will be assessed in terms of progress toward the program's long term goals. The following research questions were addressed:

1. What were the demographic characteristics of the program participants?
2. How did *Ciencias en Español* affect the academic progress of students in the program? What oral language skills in Spanish did students demonstrate during the first year? What science skills did the students demonstrate at the end of the 1995-96 school year?
3. To what extent did program staff participate in the program training?
4. How were parents involved in the program and what were their perceptions of the program?
5. What were the perceptions of school personnel about effectiveness and what recommendations did they make to improve the program?

Methods

Program Participants

All of the participants in the *Ciencias en Español* program are students in the Gifted and Talented program at Herod Elementary. During the orientation process, *Ciencias en Español* was described and parents were informed that upon their child's selection to the Gifted and Talented Vanguard program, they would participate in the *Ciencias en Español* project. During the May 1996 orientation meeting, parents from the incoming 1996-97 group of potential students were invited to observe students in the *Ciencias* laboratory classroom.

Since the program was implemented during the second semester, the existing schedule of classes postponed the use of "lab buddies" during the first

year of program implementation. As envisioned, native Spanish speakers would be part of the *Ciencias en Español* laboratory class to assist primarily English-speaking students follow directions and encourage verbal response in Spanish. Implementation of this component is expected for the fall of 1996.

Evaluation Design and Data Collection

Qualitative and quantitative data were employed in reviewing the implementation of this evaluation. Several instruments were used to develop a baseline of performance for the student participants. Interviews were conducted with program staff, administrators and parents with children in the program. Monthly observations were conducted to determine the progress of the children in the program. The teacher used a video camera to record progress visually which when edited will also serve as a training tool. Surveys were developed by a University of Houston (UH) consultant in collaboration with the principal, program teacher and coordinator, program evaluator and parents on the advisory committee. The surveys were administered in May and analyzed by both the UH consultant and the evaluation specialist. The response rate on the student survey was 100% of the students in the program. During the same time, the four classroom teachers were asked to complete a survey to determine their perceptions of the program. All the teachers completed and returned a completed survey. A parent survey was sent home with each child for their parent or guardian to complete. Sixty percent of the parents completed and returned a survey by May 10, 1996. A copy of the surveys with the percent response on each item can be found in Appendix D.

In HISD, few standardized tests are used for students below third grade and none are available in specific content areas like science. However, since HISD does begin testing students with a criterion-referenced test in third grade with the Texas Assessment of Academic Skills (TAAS), comparison groups will be generated for the program in 1997-98, when the current first grade students have reached third grade. Student achievement in the science will also be measured using an English version of a nationally recognized, standard achievement test.

To assess the students oral receptiveness in Spanish language acquisition, a Spanish adaptation of the Peabody Picture Vocabulary Test was used as a pre and post instructional tool. The Peabody Picture Vocabulary Test is a norm referenced, standardized

measure for assessing language development of 2-18 year olds. Using the same format, a Spanish version entitled *Test de Vocabulario en Imágenes Peabody* (TVIP) was designed to determine the child's language receptiveness and vocabulary acquisition for primarily Spanish-speaking students. Student performance is based on the number of consecutive plates or pictures the child correctly identifies. Validity and reliability of the test can be found in *Buros Mental Measurement Yearbook* (1978, 1984, 1989). As specified in the grant proposal, this instrument will continue to be administered to students through third grade.

Science progress was measured by the classroom teacher on the Primary Progress Report and by the *Ciencias en Español* teacher using a teacher designed check list based on the Texas Essential Elements. As part of the portfolio assessment there was also a review of the student's journal and class projects. These were supported by observer comments, and by survey comments from both staff and parents. A video filmed during the beginning of instruction and again during the final week of class provided qualitative data on the change in student knowledge of science and the scientific process. The teacher assessment checklist and portfolio items for assessing science progress are in Appendix A.

Project staff training was tracked by the program director through the use of a project timeline. Parental involvement was also documented by an attendance sheet at each function as monitored by the program director and the Magnet Coordinator.

Results

What were the demographic characteristics of the program participants?

The 1995-96, District and School Profiles describes Herod Elementary as a school with 760 students, of which 22% are African American, 9% are Asian, 22% Hispanic and 47% White. Of these students, 28% are on free/reduced lunch, 23% are at-risk, 16% are limited English proficient (LEP) and 15% are enrolled in Bilingual and/or ESL programs. As a Magnet School for Vanguard Gifted and Talented students, 37% of the student population is enrolled the Gifted and/or Talented program. The Magnet program is designed to offer programs whose quality and special focus attract students from across the district to increase the percentage of students attend-

ing integrated schools, while decreasing the number of one-race schools. *Ciencias en Español* fits well into the stated district criteria for the GT program. Table 1 presents the distribution of students by grade level, gender and native language group. All the participating students were fluent in English and so were designated as being Fluent English Proficient (FEP).

The information in Table 1 illustrates that all the students were fluent in English with only one child that was also fluent in Spanish. Fifty-five percent of the first grade class was male, while in kindergarten the majority (53%) were female.

Table 1: Demographics of Program Participants

Grade	Number n	Female		Male		FEP*
		n	%	n	%	
Kindergarten	34	17	50	17	50	34
First Grade	40	18	45	22	55	40
Total	74	34	100	49	100	74

*FEP-Fluent English Proficient

How did *Ciencias en Español* affect the academic progress of students in the program? What Spanish oral language skills did students demonstrate during the first year? What science skills did the students demonstrate at the end of the first year?

Because students were instructed in Spanish ongoing assessment of the effectiveness of the communication was charted by the teacher. The students attention level and the product of the laboratory activity were constant barometers of the process. Progress was formally evaluated using qualitative and quantitative information.

Quantitative

Spanish language proficiency for the program participants was assessed during the first months of the program. A Spanish version of the Peabody Picture Vocabulary Test (TVIP) was administered twice to all the students in the program. The results of student performance is summarized in Table 2.

In December 1995, TVIP was individually administered to all the program participants. This provided a base score of Spanish language proficiency. The mean raw score for the students in kindergarten was

7 correct responses and the mean raw score for the first graders was 6 out of a possible 125 items. Because one student's score differed significantly from the group performance, it was not included in the

Table 2: Spanish Assessment Scores by Grade

Grade	Pre Test		Post Test	
	n	Age*	n	Age*
Kindergarten	22	2.4	22	5.5
First Grade	26	2.5	26	6.0

* In years and months

group average. This student's high performance on the measure was due to differences in his educational background. On average, compared to the norm group, students demonstrated Spanish language acquisition skills of two to three year-old Spanish-speaking children.

TVIP was administered to each student again in May 1996 to measure growth in language acquisition. Using the same procedures, each student was tested individually. As reported in Table 2 and illustrated in Figure 1, on the May TVIP, the class mean was higher for each of the four class, indicating significant improvement from the pre class scores.

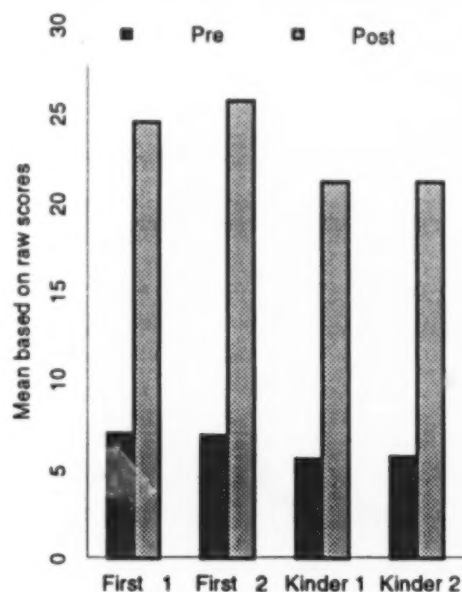


Figure 1: TVIP Mean Scores for Participants

The number of correct items was on average 27 for the first grade students and 22 correct items for the kindergartners. By the end of the semester, the kindergartners demonstrated language acquisition skills of Spanish-speaking children at 5 years 5 months. This would seem to indicate that in terms of receptive language awareness, on average, they understand almost as much as Spanish-fluent children of the same age.

Both the kindergarten students and the first graders demonstrated Spanish language acquisition skills of beginning first graders. This indicates growth in the students' ability to understand Spanish words. It must be pointed out, however, that this measure was not designed to test the language development of English-dominant children. Therefore, the scores are best examined in relation to this population rather than comparing it to other group norms.

Qualitative

In addition to the student feedback, observations by various adults provided information to the instructor particularly during the first month of the program. The Magnet Coordinator, principal and the program evaluator were three of the people who observed in the classroom. Listed below is a description of a typical observation by the program evaluator.

Classroom Setting

It was a pleasant surprise to enter the room after having seen the portable classroom before it was transformed into the *Ciencias en Español* laboratory. It was evident upon a glance that much of the science equipment had arrived. Prominent in the room were three child-sized laboratory tables. The tables were a shiny black and appeared to be about 3-4 feet high. There were no chairs at the tables but several were stacked in the back of the room. Each table had been divided into four quadrants with masking tape. Every quadrant or work station had the following items:

- 4 small cups filled half way with a liquid
- Stir sticks by each cup
- Directly behind the second cup was a small container with a little salt;
- Behind the next cup was an eye dropper with liquid soap;
- Beside the last container was a syringe with green food coloring.
- In the center of the work area was a plastic bowl with 2 green crayons, (one for each child)
- There were two prepared worksheets to record

the results of the experiment at each station.

On the wall-length back counter, there was a large glass box, for housing fish or plants. Nearby was a plastic container containing a teacher-made lab journal for each student. Pencils were neatly placed beside the journals and new crayons in their boxes were stacked nearby. A green, plastic tub with about one inch of water in it also was also placed on the counter along with other items required for the daily experiment. The aide sat quietly working at the teacher's desk placed in the far corner of the room. On a portable table, situated in prominent view stood a big-screen Apple computer with a printer and an overhead projector. Basic colors were used to divide the class into work groups. Names of students in the class were displayed on a chart with clear pockets, located on a movable wall-sized bulletin board stationed behind the computer work station. Small rectangular windows on either side of the front wall marked the formal instructional area.

Every wall presented a colorful scientific display. One wall had several clocks with the time in different parts of the world as well as in Houston. On another, the steps of the scientific process were displayed with cartoon-like figures demonstrating each step. On the front wall near the door were the rules for behavior in the lab. On a chart were the steps children needed to follow upon entering the *Ciencias* lab. Everything was labeled using Spanish words and sentences. Pictures gave visual clues as to the content. The board in the front of the room had pre-printed cards with the days of the week on them and a calendar. The teacher sat in a chair with the students, who were seated on the floor facing her. Behind her, a green chalk board and a white board contained elements of the units of study as well as the current lesson. On the white board the teacher had printed the following:

Instrucciones

1. Poner la sal en el agua y mover con el palito.
2. Poner el jabón en el agua y mover con el palito.
3. Enchar el color en los 4 vasos.
4. Mover con el palito los 4 vasos.
5. Colorear lo que pasó.

Ciencias en Español Class

This observation took place February, 8, 1996. The lesson for a first grade class was in progress. There were 18 out of the 22 children sitting on the floor listening intently to the teacher who conducted the class in Spanish. Students were looking at the board, while the teacher pointed to pre-printed words con-

taining the days of the week in Spanish. As she pointed and said the word the students repeated it after her. She then pointed to the date and they said it together. Then one student was asked to read the date in Spanish. The child read "Hoy es jueves 8 de febrero de 1996." She praised him, had another child repeat it and then began introducing the science activity for the day.

On this day, she told them in Spanish, they were to observe the difference in the way the different liquids absorbed the green food coloring. As she pointed to each item as she read, sometimes printing or drawing a picture and motioning to them, at which point they repeated the directions for completing the experiment. She demonstrated each step of the experiment. After giving a directive she would ask a student to tell what she was doing. "You are putting something into the glass", "You are putting color into the water", one then another child answered. If incorrect or incomplete the response was ignored or expanded upon in Spanish. Then the activity would be repeated. If correct, the teacher would praise the child, repeat the directive in Spanish and motion the child to come and stand in front of the group. Then the child would stand next to the teacher and tell the whole group the direction in English. After she demonstrated and had a child translate each step, she repeated the entire directions pointing to each item as it was written on the board. The class would then repeat all the directions in Spanish. Then she asked the class if they understood the activity. The students answered "Si" in unison.

As each child selected a card they went to their work station with their partner. The teacher's aide who had been quietly preparing the materials for the experiment, moved to one of the tables as the first group of students arrived at the table and started reaching for their materials. When students asked her a question, she would respond in Spanish. Both she and the teacher moved from one table to another assisting each pair of students with completing the experiment. The students would ask one another questions as they proceeded through the experiment. After completing it, each took the green crayon and recorded in pictures the result of their findings on the worksheet. Then after showing it to the teacher, they added it to a pile on the back table and picked up their lab books, colors and pencils went to the front and sat on floor again. The pages in the journal were blank. Children began by drawing what they had observed or accomplished. By the end of the class they were to

print the date from the board and add one thing they had learned in the lab journal. When their classroom teacher entered the room, the students looked up from the activity, picked up their journals, put the materials back where they found them and left the room.

The next group was a kindergarten class. They followed much the same plan except that the instructional time on the rug included a brief poem. The focus of the lesson was on more oral expression. Instead of directing the students toward reading the directions, the teacher simply had them repeat them. Another modification noticed was at the laboratory tables where the syringe was not initially placed with the other materials and the stir sticks were put in the liquid directly. The kindergarten children followed the directions up to using the eye dropper to add soap to the third cup. Soap was added to all three cups. They wanted to know what they were supposed to see and wanted to do it "right". Throughout the lesson they were equally as attentive as the first graders. They completed the activity and when the classroom teacher entered, she asked them in English what they had done today. Students were eager to tell about the activity, and what they discovered. She looked at their work, praised them for what they had accomplished, and they left the *Ciencias* lab.

Observations

The environment seemed carefully designed to maximize student learning of science concepts and process. Children appeared focused on the task during the actual experimental time at the tables. They showed care in following each procedure accurately. Each pair of students worked to complete the steps of the experiment with relative confidence and speed. Children were observed assisting others at the tables to clarify their observations so they were recorded accurately on the worksheet. Children discussed what they were doing aloud, seemingly without expecting the adults to listen or answer. Occasionally, another child would engage and then it would become a conversation. This talk was always in English. If they wanted something from the teacher or aide, students would ask in English and then repeat one or two of the teacher's words in order to get the requested item. For example, if they wanted a green crayon, they would ask the teacher for it in English. She would restate the request in Spanish, nod assent, get the requested item and say what she was doing in Spanish. Because it was expected, the child would

respond with a Spanish word like "verde", which, if correct, earned the child a teacher-smile along with the requested item.

The transition between one class and another did not seem to permit much time for the teacher to observe or understand the lesson in the *Ciencias* room. When the children told the classroom teacher what they learned, little reinforcement from the classroom teacher was observed. Teacher comments were focused around the product "Hold on to your worksheets, it's windy outside" rather than on the science concept. It also appeared from the observations that the teachers did not understand how the daily experimental activity tied to the overall unit discussed during collaboration.

During another observation in May, children were observed using Spanish words among themselves interspersed within English sentences. They were also reading the Spanish words they saw on the walls around the room without an oral stimulus or after hearing the teacher say it first. They were observed copying Spanish sentences from the board into their journals and telling one another what it meant. Whereas in the beginning of the semester drawing occupied most of the student time and interest, at this point composing sentences was the focus.

What science skills did the students demonstrate at the end of the first year?

Table 3 illustrates the major science assessment instruments. It also shows the number of students that mastered the expected level in each grade.

In keeping with the Texas Essential Elements for primary students in science, student achievement was documented by teacher observation in their classrooms throughout the year and by the *Ciencias* teachers at the end of the year. The classroom teachers reported that every child in the program advanced at least one developmental level in the framework outlined in the Primary Progress Report. For the kindergarten students this meant that they moved from the Discovery stage to the Exploration and Developing stages. Throughout the 1995-96 school year, 22 kindergarten students moved two developmental levels. The first grade students progressed from the Exploration stage to the Expanding and Connecting stages. Nineteen first grade students also progressed two levels and moved beyond the Expanding into the Connecting stage. Twenty one students or 53% progressed one developmental level.

Table 3: Number and Percent of Students Mastering Science Progress Measures by Grade in May 1996

Primary Progress Report	Kinder		Grade 1	
	n	%	n	%
Discovery Stage to Exploration	12	35	0	0
Exploration Stage to Developing	22	65	0	0
Developing Stage to Expanding	0	0	21	53
Expanding Stage to Connecting	0	0	19	47
Ciencias Laboratory Skills				
Demonstrates laboratory skills	34	100	38	100
Uses senses for information	34	100	38	93
Classifies and sequences data	11	32	31	74
Measures according to directions	23	68	24	57
Infers logically to predict results	2	06	1	02
Communicates data (in Spanish)	2	06	1	02

Texas essential elements for Science provided the framework for instruction. Unit and lesson items, as they addressed the essential elements for each grade were part of the weekly collaboration process between the classroom teachers and the *Ciencias en Español* teacher. The *Ciencias en Español* teacher also assessed the progress of the students based on their laboratory class performance. She reported that students in both kindergarten and first graders demonstrated mastery of the process of collecting and observing data. However, according to her observations, student skills based on expressive language communication were not mastered during the time provided. Copies of the Science Assessment Portfolio items can be found in Appendix A. An additional checklist is also included that will be implemented during the 1996-97 school year.

To what extent did program staff participate in the program training?

The project director/teacher attended several conferences including the following: National Science Teachers Association Conference in San Antonio, Texas Foreign Language Association Conference in Midland, Texas, as well as the U.S. Department of Education's Second Annual Conference on Improving America's Schools in Washington, D.C. The teacher's aide to the project is currently taking courses to prepare her for bilingual instruction endorsement. Two of the four classroom teachers attended the state Foreign Language Conference in Midland, Texas. All of the teachers and the science

teacher/project Coordinator participated in 20 hours of staff development on campus to develop new science units for fall 1996 courses. An Accelerated Spanish Class was offered for the staff during July 1996 and will be repeated during the fall semester. The program instructors and teacher aide were trained in teaching and learning strategies designed for English/Spanish as a second language. A copy of the dates for teacher and staff training and the attendance at each event can be found in Appendix C.

How were parents involved in the program and what were their perceptions of the program?

Parent involvement was considered a necessary component in successful dual language and foreign language immersion programs to maximize student learning and encourage other parents whose children were just entering the program. As envisioned, parental involvement in the program allowed parents to gain an understanding of the program and appreciation for their children's accomplishments. It was also intended to provide additional resources within the scientific community. At the first parent meeting, parents volunteered to become part of a six-member board that worked with the *Ciencias* teacher and GT Magnet Coordinator in program planning and in solving problems related to communication between parents and the school. As such, the *Ciencias en Español* program initiated a model for a parent advisory board, as well as offered all parents opportunities for greater involvement in the program. See Appendix E for a list of programs and/or activities designed for parent participation and the number of parent participants at each function. During the 1996-97 school year the parent advisory committee will offer a list of speakers and activities for parent interaction and involvement.

There were several ways that parents could become involved in the program. As part of the language component, parents of students in the program were provided instruction in Spanish language. Two levels of Accelerated Spanish courses, provided by the district, were also held in the spring semester from February 20 through March 5, 1996. Eleven of the parents participated in the intensive two-week course.

Parents were provided information that would assist them in helping their children with home instruction. A monthly newsletter was sent home with the students (Appendix F). Make and Take sessions were held to provide parents with necessary materials

to aid in providing the students additional instructional support at home.

The majority of the respondents indicated that they were satisfied or very satisfied with major elements of the program. Parent suggestions for improvement in the program are illustrated in Table 4. There was a more positive response for the science component than the Spanish instruction. Overall, parents were satisfied and felt that their children were satisfied with the program. In addition, they felt that progress was being made, use of technology was positive, and the science laboratory environment was a positive factor. On the Parent survey 14% indicated that they attended the Spanish classes and found them helpful and 39% indicated that they plan to attend the Spanish classes next year. Since most of

Table 4: Parent Response on Survey Question

How could this program be improved?

- 21% The parents need more information on what concepts are being taught during the week, so they can reinforce them at home. /I would really like to see a weekly newsletter or information sheet on the experiments done and their purpose.
- 15% I'd like to see more coordination between the *Ciencias* teacher and the children's regular teacher.
- 15% Science is a way of thinking. I feel strongly that the science concepts and information I want my kids to be getting just can't be taught exclusively in Spanish.
- 13% My daughter feels that she would like to take more time on each experiment. She thinks it moves too fast.
- 12% More Spanish instruction is needed. /Have the kids verbalize with each other more.
- 8% Drop Spanish and reinforce science in the classroom./Teach separately. Strengthen science in the regular classroom.
- 8% The newsletter and "Make and Take" were terrific, but the newsletter needs to provide information on what science concepts and skills are being taught.
- 5% I appreciate the information received about the program, but didn't feel that the parents had input. It felt like one-way communication.
- 6% Some follow-up on Spanish language reinforcement during the summer.
- 5% More Spanish classes for parents to help children learn the language.
- 4% Don't know. Can't improve it.
- 2% Allow an "out" for parents who object.

the respondents had more than one comment, total percent of responses appears greater than 100%.

Parental/Language classes:

Thirty-nine percent of the parents stated that they would be interested in attending Spanish classes next year, but 51% indicated that they did not plan to attend. Parents recommended revising the format of the adult language classes to include vocabulary that would match that taught to their children, so they could assist in reviewing the language instruction.

Student Language Development:

Although parents and teachers were pleased with students' language development, parents' responses noted that student progress was not clear. On the parents response to the question about how the program could be improved, parents shared and individual concerns. One parent recommended more feedback from teachers with regard to second language skills, while another felt more work should be done in the classroom in both science and Spanish.

What were the perceptions of school personnel about effectiveness and what recommendations did they make to improve the program?

Overall, parents reported being impressed with the enthusiasm as well as the knowledge of science they observed in their children. As seen in Table 5, participating students and teachers rated the amount of Spanish learned much higher than the parents, but the majority in all the groups (over 50%) perceived an increase in the children's ability to function in a Spanish-speaking environment.

A majority of all three groups had a positive response to the program. A majority of the responding parents also indicated that the newsletter informed

them about program activities. All three groups commented that the highlight of the program was the focus on action. The students illustrated this through a personal drawings on the Student Survey in which they were directed to "Draw a picture of yourself in the Spanish science lab." In the drawing, 85% illustrated the laboratory setting. On those, 27% clearly depicted one of the science activities and an additional 7% drew some piece of science equipment. One child carefully drew big hands holding a glass at the science table. The teachers commented on the "hands-on" activities and the parents seemed to agree with comments like "What impressed me the most was the hands-on approach to both science and Spanish." Teachers and parents wrote that they were also impressed with the dedication of the teacher, and with the effort of the energetic, caring staff working toward the students' success. Teachers reported that they liked the activities, the student enthusiasm and teacher's dedication.

In response to the question about how the program could be improved, teachers and parents mentioned extending communication. Teachers suggested increasing the collaborative activities to integrate the science concepts and activities. Parents expressed a desire to receive weekly rather than monthly bulletins about the program. Some of the parents said that they wanted more knowledge of the Spanish vocabulary so they could help their child review. Others expressed a desire to know the concepts behind the experiments so they could extend the learning activities.

Discussion

Within the first semester of instruction, students in the *Ciencias en Español*, program demonstrated progress in science as well as in receptive Spanish language. During the initial program implementation some parents continued to express concerns and questioned the value of the program in parent/teacher interactions, formal parent meetings and in parent advisory committee meetings. The dedication of the staff and the enthusiasm of the students helped overcome these initial obstacles. Having passed the first hurdle, the next significant decision-making point appears to be at the end of the 1997-98 school year when the first graders complete third grade.

Language immersion in the content area was a new concept that was interpreted daily by the *Ciencias en Español* (CEE) staff as they worked with the

Table 5: Survey Results with the Percentage of Each Group on the Key Program Issues

Key Issues	Class	Parents	Teachers
	% Agree	% Agree	% Agree
Overall enjoyment of the <i>Ciencias</i> class	97	63	100
Satisfaction with science learned	92	71	100
Satisfaction with Spanish learned	87	65	100
Valued experience	94	80	100

students. As stated in the grant, the Ciencias teacher would initially present the scientific concept and provide student learning in a activity-based program. "The collaborating classroom teachers will reinforce, extend and enrich concepts previously introduced by the CEE teachers through center activities, extension projects, special projects, journal writing, lab time and other disciplines" (p 10). By the end of the first implementation cycle in May 1996, the laboratory experience indicated a need for more effective collaboration between the classroom teachers and *Ciencias en Español* teacher. Teacher observation of the students in the *Ciencias* Lab, as well as involvement of the *Ciencias* teacher in the science activities in the classroom might provide a greater degree of integration between experience and concept development for the students in the program.

Use of "lab buddies" or fluent Spanish-speaking student helpers in the laboratory was a component of the initial proposal. The logistics of arranging classes and schedules along with instructional considerations like the maximum number of children in the class for optimum instruction are but a few of the problems involved in incorporating primarily-Spanish speaking children into the existing program. During the spring semester, the only persons speaking Spanish in the *Ciencias* laboratory were the instructors, so the immersion process was limited. To achieve more intensity or establish the necessity for verbal communication in Spanish, more Spanish speakers should be part of the program.

In May 1996, a survey of children, teachers and parents found that the majority believed the program to be successful in providing an enhanced science program for the students. The enthusiasm with which the children approached learning Spanish within the content area both parents and teachers. A few concerns, however, were raised regarding the issues of communication. Parents expressed a desire to receive a weekly rather than monthly newsletter and teachers expressed the need for more assistance in supporting or extending the lab instruction in their individual classrooms.

On the survey, parents indicated that they wanted more involvement in the students' learning process. As stated in the grant, a full-time project coordinator would facilitate the administrative duties to the grant agency, build parent support through

communication and involvement, and collaborate with the classroom teachers. During the first year of implementation the *Ciencias en Español* teacher and the Magnet Coordinator shared the duties.

The first year of implementation brought experience to those implementing the program. In an effort to provide the best instructional climate for the students, teacher and parents, along with concerned program and building staff assisted in formulating the following recommendations.

Recommendations

1. To create an environment that fosters immersion in Spanish, the number of Spanish-speaking students in the *Ciencias en Español* classes should be increased.
2. Based on teacher comments on the survey and classroom observations it would seem advisable to provide more time for integration of instruction between the *Ciencias* laboratory teacher and the classroom teacher. One way of doing this would be to have the classroom teacher remain with the students in the *Ciencias* lab for part of their instructional time and then have the *Ciencias* teacher spend time in the regular classroom.
3. Regular communication with program parents should emphasize student performance. Parents should be provided with available, objective level data regarding students' performance.
4. The need for ongoing assessment and the development of adequate tools to accurately measure growth in both science and in Spanish language acquisition should be addressed either in finding or devising useful assessment tools.
5. Parent concerns, staff support and the planning needed to promote community interaction reflect the need for a program director apart from the role of teacher, as stated in the original grant proposal.
6. Adult Spanish classes are needed, at varying times to meet the parents' schedules. The class should be tailored to provide vocabulary and skills to enhance their child's learning environment.

APPENDIX A

SCIENCE ACHIEVEMENT
PRIMARY PROGRESS REPORT

KINDERGARTEN 1995-96

Intellectual development in Science includes the following developmental levels:

		1995	1996	Assessed By
(A)	DISCOVERY STAGE		14	Class teacher

Observation

Makes observations using five senses

Classification

Displays interest in manipulating objects

Investigation

Displays curiosity about environment; most interactions are tactile

Use of Knowledge

Stores data, observations and scientific content

Describes and shares knowledge in a variety of ways

(B)	EXPLORATION STAGE		20	Class teacher
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Observation

Recognizes obvious qualities of objects or events using five senses

Classification

Arranges objects in logical order

Sorts objects by a single attribute

Investigation

Predicts and orally summarizes experiments with adult direction

Explores simple tools of investigation

Use of Knowledge

Pulls up stored knowledge for discussing, experimenting classifying and comparing of contrasting experiences.

(C)	DEVELOPING STAGE			Class teacher
-----	------------------	--	--	---------------

Observation

Uses the five senses to describe multiple differences in objects

Classification

Uses at least two attributes to classify objects

Investigation

Predicts, experiments and records data with adult direction

Uses simple tools of investigation

Use of Knowledge

Uses knowledge to understand change, predict outcomes, explain events

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APPENDIX A

SCIENCE ACHIEVEMENT
PRIMARY PROGRESS REPORT

FIRST GRADE

Students moved from one developmental level to another through the year. Intellectual development in Science includes the following developmental levels:

	1995	1996	Assessed By
(A) DISCOVERY STAGE			Class teacher

Observation

Makes observations using five senses

Classification

Displays interest in manipulating objects

Investigation

Displays curiosity about environment; most interactions are tactile

Use of Knowledge

Stores data, observations and scientific content

Describes and shares knowledge in a variety of ways

(B) EXPLORATION STAGE			Class teacher
-----------------------	--	--	---------------

Observation

Recognizes obvious qualities of objects or events using five senses

Classification

Arranges objects in logical order

Sorts objects by a single attribute

Investigation

Predicts and orally summarizes experiments with adult direction

Explores simple tools of investigation

Use of Knowledge

Pulls up stored knowledge for discussing, experimenting classifying and comparing of contrasting experiences.

(C) DEVELOPING STAGE	13		Class teacher
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Observation

Uses the five senses to describe multiple differences in objects

Classification

Uses at least two attributes to classify objects

Investigation

Predicts, experiments and records data with adult direction

Uses simple tools of investigation

Use of Knowledge

Uses knowledge to understand change, predict outcomes or explain events

APPENDIX A

SCIENCE ACHIEVEMENT
PRIMARY PROGRESS REPORT

FIRST GRADE Continued

		1995	1996	Assessed By
(D)	EXPANDING STAGE	22	13	Class teacher

Observation

Asks questions about information obtained through observations using the five senses

Classification

Reclassifies groups according to different attributes and states the rule for each

Investigation

Predicts, experiments, records data and draws conclusions with adult direction

Uses science equipment with adult help

Use of Knowledge

Asks questions about stored knowledge

Mentally categorizes bills of knowledge to solve problems

(E)	CONNECTING STAGE		22	Class teacher
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Observation

Gathers additional information using sensory observations, print interviews, discussions, investigations, etc.

Classification

Uses additional attributes to form subgroups from existing groups

Investigation

Cooperatively carries out an investigation, based on an assigned problem, using scientific processes with assistance

Selects and uses science equipment with a group

Use of Knowledge

Seeks further knowledge about a given topic to make decisions or draw conclusions

Has a wide scientific knowledge base

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APPENDIX A 1

ESSENTIAL ELEMENTS IN SCIENCE ASSESSMENT

75.22 Kindergarten Education

Intellectual development in kindergarten shall include the following essential elements:

- (1) Knowledge of communication. Receptive/expressive language integrated through meaningful listening/speaking and print-related experiences.
- (2) Knowledge of integrated content. Integrated content acquired through identifying comparing and contrasting, sequencing and order, predicting cause/effect relationships and exploring.

Opportunities provided:	Unit #					Mastery	Assessment Date
	1	2	3	4	5	√ if Yes	
(A) Identify:							
Match objects in a 1-1 correspondence							
Recognize various geometric shapes							
Use five senses to gain information							
Count objects orally from low to high							
Describe changes in objects, organisms							
Practice safety related to science							
(B) Compare and contrast:							
Recognize that there are differences							
Compare sets using concepts such as more, less & as many to solve problems							
Recognize part and whole relationships							
Compare two concrete objects in length, height, capacity and size							
(C) Classify:							
Form groups by sorting and matching objects using more than one attribute							
Classify a variety of objects as being living and non-living							
(D) Sequence and order:							
Copy and record linear patterns							
Describe sequences in routines							
(E) Predict cause and effect relationships:							
Observe changes in nature and events							
Draw conclusions and predict outcomes							
Assist in making rules particularly safety							
(F) Explore:							
Demonstrate creative thinking							
Construct structures with materials							
Explore weight, mass and volume							
Recognize attributes, patterns and relationships using concrete objects							

APPENDIX A 1 ESSENTIAL ELEMENTS IN SCIENCE ASSESSMENT

75.27 First Grade

Science grade one, shall have a balance of content and activities, shall focus on the life sciences, and shall include the following essential elements:

Opportunities provided:

(1) Manipulate materials & equipment.

Manipulate objects and models

Use appropriate to life

Construct 2 and 3 dimensional models

Practice safety

Unit #

1 2 3 4 5

Mastery

√ if Yes

Assessment Date

(2) Acquire data through the senses.

Use the senses

Observe science models

Observe properties of objects

Observe similarities and differences

Observe phenomena resulting from life

Explore the environment

(3) Classify, order and sequence data.

Arrange time and activities in order

Classify by similarities and differences

(4) Communicate data and information in appropriate oral and written form.

Obtain science information from resources

Describe objects and events in environment

Detail apparent changes in size at various distances

Record and interpret data on pictorial graphs, bar graphs and maps

(5) Measure using relationships to standards.

Estimate, measure and compare linear properties of objects using metric units

Compare temperature of objects

Explore the concept of time by minutes

APPENDIX A 1

ESSENTIAL ELEMENTS IN SCIENCE (CONT.)

	Unit #					Mastery √ if Yes	Assessment Date
	1	2	3	4	5		
(6) Draw inferences, predict outcomes, and form generalized statements.							
Identify cause and effect relationships							
Predict outcomes of action from data							
State generalizations about similarities and differences in objects and/or events							
Draw conclusions from observed data							
(7) Relate objects and events to other objects and events.							
Compare and contrast objects and events to other objects and events							
Relate objects and activities to daily life							
Relate science to careers							
(8) Apply defined terms based on observations of objects, actions, organisms and processes.							
Define from experience "objects"							
Define from experience "actions"							
Define from experience "organisms"							
Define from experience "processes"							
(9) Identify and manipulate the conditions of investigations.							
Set up and conduct experiments using a control group and an experimental group							
Complete if/then statements and situations							
Recognize changes in objects and events							

APPENDIX A 2

Ciencias en Español Lab Skills Mastery* KINDERGARTEN

Teacher: _____

Date of Assessment: _____

E 1	EE 2	EE 3	EE 4
Manipulative laboratory skills	The use of skills in acquiring data through the senses	The use of classification in ordering and sequencing data	Experience in oral and written communication of data in an appropriate form

NAME	EE 1 Mastery	EE 2 Mastery	EE 3 Mastery	EE 4 Mastery
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

* √ = Student mastery of the Science Essential Elements, assessed in Spanish by the Ciencias en Es

APPENDIX A 2

Ciencias en Español
Lab Skills Mastery*
First Grade

Teacher: _____

Date of Assessment: _____

EE 1	EE 2	EE 3	EE 4	EE 5	EE 6	EE 7	EE 8	EE 9
Manipulative laboratory skills	Acquire data through the senses	Classify, order and sequence data	Communicate data & information in appropriate oral and written form	Measure using relationships to standards	Draw logical inferences, predict outcomes and form generalized statements	Relate objects and events to other objects and events	Apply defined terms based on observations	Identify and manipulate the conditions of investigations

NAME	EE 1 Mastery	EE 2 Mastery	EE 3 Mastery	EE 4 Mastery	EE 5 Mastery	EE 6 Mastery	EE 7 Mastery	EE 8 Mastery	EE 9 Mastery
1	✓	✓	✓						
2	✓	✓	✓						
3	✓	✓	✓						
	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	✓	✓	✓						
5	✓	✓	✓						
6	✓	✓	✓						
7	✓	✓	✓	✓					
8	✓	✓	✓						
9	✓	✓	✓						
10	✓	✓	✓						
11	✓	✓	✓						
12	✓	✓	✓						
13	✓	✓	✓						
14	✓	✓	✓						
15	✓	✓	✓						
16	✓	✓	✓						
17	✓	✓	✓						
18	✓	✓	✓						
19	✓	✓	✓	✓					

APPENDIX B

CIENCIAS EN ESPAÑOL
DAILY SCHEDULE

Patricia Hinojosa
Teacher

Spring Semester, 1996
Date

TIME	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8: 45 - 9:30	Collaboration Kindergarten	Lathan Kindergarten	Bracho Kindergarten	Francis First Grade	Ciencias Lab open for school use
9: 35 - 10:15		Bracho Kindergarten	Zionts First Grade	Lathan Kindergarten	Ciencias Lab open for school use
11:30 - 12:15	Lathan Kindergarten		Lathan Kindergarten		Ciencias Lab open for school use
12:15 - 1:00	Francis First Grade				Ciencias Lab open for school use
1:05 - 1:50	Bracho Kindergarten	Zionts First Grade	Francis First Grade	Bracho Kindergarten	Ciencias Lab open for school use
1: 55 - 2:35	Zionts First Grade	Francis First Grade	Collaboration First Grade	Zionts First Grade	Ciencias Lab open for school use

APPENDIX C

STAFF QUALIFICATIONS

Collaborating Teachers

Susan Bracho completed her B.S. at Temple University in Philadelphia, Pennsylvania. After arriving in Houston, Mrs. Bracho taught one year of preschool and over eleven years of kindergarten. She has been teaching gifted education for more than eight years, has completed fifteen hours of graduate studies and is currently teaching kindergarten in the Gifted and Talented program at Herod Elementary.

Belinda Francis earned a B.S. from the University of Houston and her M.Ed. in Elementary Education from Texas Southern University, along with Gifted and Talented Endorsement from the University of St. Thomas. She was the 1991-92 Teacher of the Year. With more than eighteen years, she is a first grade teacher in the Gifted and Talented program at Herod.

Connie Lathan received her degree from the University of Houston. She emphasized a hands-on approach based on her belief that children learn by doing. In 1992-93 she was the Teacher of the Year. She is a kindergarten teacher for students in the Gifted and Talented program at Herod.

Carol Sue Zions studied for a B.A. degree from Newcomb College at Tulane University and completed additional course work toward endorsement of gifted and talented students at the University of St. Thomas. She was selected as the 1993-94 Teacher of the Year. After more than fourteen years of teaching experience, she is currently teaching first grade in the Gifted and Talented program.

Program Administrators

Nancy Nichols has been principal at Herod Elementary School for over seven years, after beginning as a classroom teacher. She received her B.A. from Trinity University in San Antonio, Texas. At the University of Houston, she earned her M.Ed. and certification in educational supervision and middle-level man-

agement. She has worked for the Houston Independent School District for twenty-seven years and during the last three years, she worked with the Herod staff and community to develop and implement an extensive Site-Based Education model. She also led in developing and implementing a successful Dual Language program.

Jacqueline Kirksey has been a Magnet Coordinator at Herod for more than seven years. As a educator in the public schools for over twenty-one years, she has taught a variety of student populations including limited English proficient students as well as those in the Gifted and Talented program. Her B.S. was earned at the University of North Texas. She studied for Gifted and Talented endorsement from the University of St. Thomas, where she is currently working on her M.Ed.

Patricia Hinojosa was the program Coordinator as well as teacher of the Ciencias en Español program. Training in program management was obtained through a mid-level management program at Houston Baptist University in 1994. She served the district as a Title 1 Coordinator for one and a half years and worked as a specialist for the Alternative Certification program. Bringing both experience and training to administrative duties.

Program Instructors

Patricia Hinojosa was the teacher for students in both kindergarten and first grade for the Ciencias en Español class. She graduated with a B.A. degree in Music. She completed a M.Ed. in Bilingual Education in 1993. She is certified as a Bilingual teacher with special training in English as a second language (ESL) on the elementary level. Her special interest and experience are with children in the primary grades.

Susana Ramirez was the classroom assistant in the Ciencias en Español lab. She graduated from Sharpstown High School in 1992. In 1994, she enrolled and attended classes toward her Associate Degree at Houston Community College. She plans to work in bilingual education.

APPENDIX C 1
STAFF TRAINING
CIENCIAS EN ESPAÑOL

Date	Event	Location	Attending	
12/3/95- 12/6/95	National Science Teachers Association Conference	San Antonio, Texas	P. Hinojosa, J. Kirksey	
12/14/96 - 12/18/96	Foreign Language Association Conference	Midland, Texas	J. Kirksey C. Latham	P. Hinojosa N. Nichols
1/5/96- 1/8/96	Second Annual Conference for Improving America's Schools	United States Department of Education Washington, D.C.	P. Hinojosa, J. Kirksey Ms. Nichols	
1/18/96 - 5/31/96	University of Houston Spring session	Main campus	Susana Ramirez Enrolled in a 3 hour course toward Associate Degree	
6/2/96 - 6/5/96	Ciencias en Español Program	Herod	P. Hinojosa C. Zions C. Lathan Ms. Gee	J. Kirksey S. Bracho B. Francis Ms. Wilson
6/17/96 - 6/21/96	Foreign Language in Elementary School (FLES) Institute	Dallas, Texas	P. Hinojosa	
7/12/96	Spanish class for teachers	Herod	J. Kirksey Mrs. Francis	C. Lathan Ms. Gee
8/9/96	Staff Development--Summer	Herod	Ms. Gee Ms. Wilson Ms. Lipson	

Information compiled from vouchers

Appendix D

Ciencias en Español
Science in Spanish
Student Survey

Color in the happy face if your answer is yes. Color in the sad face if your answer is no. The words replaced the happy and sad faces. All the students responded to the survey.

	YES	NO
Do you like your Spanish science class?	97%	3%
Did you learn a lot about science this year?	92%	8%
Did you learn a lot about Spanish this year?	87%	13%
Do you want to learn to speak Spanish?	80%	18%
Do you want to be in Spanish science class next year?	94%	6%

Draw a picture of yourself in your Spanish science class. Rating scale

Orientation location clearly detailed in the picture

14% Anywhere 85% Lab 1% Spanish lab

Social interaction Others in the picture

77% Individual 23% Working with Others

Learning focus Teacher centered vs. child centered learning focus

14% Teacher-centered 85% Child-centered

Emotionality Expression of child pictured

66% Smile 2% Frown 32% No expression

Aspect The apparent meaning of the picture

20% Happy child

40% Child in the lab

27% Activity depicted

7% Representational

APPENDIX D 1

Ciencias en Español
Science in Spanish
Teacher Survey

Purpose : To help improve our "Ciencias en Español" program and to help meet students' instructional needs. There was a 100 % response rate.

Rate the following statements.	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The science content of this program met expectations.	100%	0%	0%	0%	0%
My students learned the necessary science skills.	75%	25%	0%	0%	0%
Spanish content of this course met my expectations.	100%	0%	0%	0%	0%
My students learned appreciation of Spanish language.	50%	50%	0%	0%	0%
My students grew in their communicative competency in Spanish since starting this program.	75%	25%	0%	0%	0%
My students enjoyed participating in this program.	75%	25%	0%	0%	0%
This has been a good experience for my students.	75%	25%	0%	0%	0%
The instructional content of the CEE and the G/T classroom was successfully integrated.	100%	0%	0%	0%	0%
There was adequate communication between the CEE and the G/T program.	75%	0%	0%	0%	0%

What do you like best about this program? Each had more than one comment

- 100% Hands-on activities The hands-on activities have been fantastic!
- 70% Students enthusiasm and language. The children have a much greater opportunity to learn a second language.
- 30% Great teaching. Mrs. Hinojosa has done an excellent job communicating with our first graders.
- 25% Lab room and equipment. The children actually working in a lab.

How could this program be improved?

- 50% No improvement needed. The program has proved most successful.
- 25% Parent communication. Better and more communication to the parents.
- 25% Teacher collaboration. More integration between the two programs would help.

Additional comments: 175% response

- 100% The children's excitement was wonderful to see.
- 50% Mrs. Hinojosa did a great job.
- 25% The children learned more science in the program than could be provided just in the regular classroom.

APPENDIX D 2

Ciencias en Español
Science in Spanish
Parent Survey

Purpose : To help us improve our "Ciencias en Español" program and to help meet your child's instructional needs.

Response rate: 60% Response by May 12, 1996

My child is in: Kindergarten 43% First Grade 57%

Strongly Agree =5, Agree =4, Neutral =3, Disagree =2, Strongly Disagree =1, Don't know =0

Mark one of the following items	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1	Don't know 0
The program's Science goals seem appropriate.	20%	53%	12%	6%	4%	4%
The program's Spanish goals are appropriate.	14%	49%	22%	6%	2%	2%
My child learned the science skills and concepts.	20%	51%	18%	2%	4%	4%
My child's ability to communicate in Spanish increased.	14%	39%	24%	14%	4%	4%
My child's interest in science was stimulated.	24%	31%	27%	14%	2%	2%
My child learned to appreciate the Spanish language.	22%	43%	22%	8%	2%	2%
My child enjoyed participating in this program.	35%	49%	10%	2%	2%	2%
This has been a good experience for my child.	33%	47%	12%	4%	4%	4%
The newsletter kept me informed about the program.	27%	43%	14%	14%	0%	0%
I had the opportunity to give input into the program.	14%	41%	22%	14%	6%	6%
Overall, I like the program.	24%	39%	27%	6%	4%	4%

	Too Easy	About Right	Too Hard	Both	Don't Know
The science curriculum is:	12%	76%	4%	2%	2%
The Spanish curriculum is:	12%	80%	6%	0%	2%

Instructions : Indicate either Yes or No.	Yes	No	Don't Know
I attended the accelerated Spanish classes.	14%	86%	0%
I found the Spanish classes helpful.	16%	33%	24%
I am interested in attending the Spanish classes next year.	39%	51%	8%

APPENDIX D 2

Continued

What do you like best about this program?

- 25% The combination of language and science./The hands-on approach to both science and Spanish./ Learned both the science and Spanish.
- 12% My child enjoys it./ "I get to learn Spanish and it's fun!", she says./ He was very excited about the program./I know they are having fun while learning.
- 12% The children are all exposed to a second language in an interesting way makes learning Spanish easier and more natural. /Exposure to Spanish. /I like the opportunity for my child to be exposed to another language while still young. /The way the children are spoken to (conversation) completely in Spanish is good. /The fact that we are getting 4 days a week of language. /I like the immersion approach to learning the Spanish.
- 18% The Ciencias teacher's hard work under very difficult conditions of developing a new program./ I think Ciencias teacher is a terrific teacher./I like the Ciencias teacher because she makes the program interesting to the kids./Effort of staff, very energetic, caring and trying for success.
- 10% My child talks about the fun experiments./My child stated he enjoyed the science part of the program. The opportunity for more science experiences./four days a week of science education./It gives my child the chance to participate more in science activities on a consistent basis./Impressed by the different experiments conducted.
- 10% I enjoyed having my child tell me about their findings/passed this information on to me./I like the confidence its given her in trying to speak Spanish. But at the dinner table she chatters away in her[Name] version of Spanish
- 8% I like the small papers sent home with information about the particular experiment,
- 5% The Make and Take sessions are good.

How could this program be improved?

- 20% The parents need more information on what concepts are being taught during the week so they can reinforce them at home./ I would really like to see a weekly newsletter or information sheet on what experiments have been done and what their purpose was.
- 15% The hands-on, empirical observation classification in Ciencias needs to be reinforced in the regular classroom./ I'd like to see more co-ordination between the Ciencias teacher and the children's regular teacher.
- 15% Science is a way of thinking. This involves the students' understanding the underlying principles of science and most importantly learning to ask questions. /I do not believe the concepts are adequately understood by the students when they are explained in a foreign language./I feel strongly that the science concepts and information I want my kids to be getting just can't be taught exclusively in Spanish.
- 13% My daughter feels that she would like more time on each experiment. She think it moves too fast./ My son complained at times that he was not able to do each activity. /More experiments versus "art" projects. /More hands-on with materials kids relate to..
- 12% More Spanish is needed./Have the kids verbalize with each other more./If really no English was spoken in the science lab classroom.
- 8% Drop Spanish and reinforce science in the classroom./Teach the subjects separately. Have an English only science lab./Strengthen the teaching of science in the regular classroom and not rely on the "Ciencias" program exclusively for science.
- 6% Some follow-up on Spanish language reinforcement during the summer is needed.
- 5% More Spanish classes for parents to help children learn the language.
- 4% Don't know. Can't improve it
- 2% allow an "out" for parents who object.

APPENDIX D 2

Continued

Additional Comments: In addition to those previously discussed.

- 21% While skeptical at the beginning of this program, I am pleased that my child does seem to be getting the science part. I'm hoping the Spanish will follow. I'm willing to give it another year./In the beginning of the year I was totally against this program. thought teaching science in Spanish was a TERRIBLE idea. After all teaching scientific principles was hard enough in English! I liked the idea of total immersion, but in science!? No way! I was wrong. This way she gets twice as much science and she likes it. She likes learning Spanish, she likes her 2 Ciencias teachers and she likes doing things in a lab just like her daddy. So now, instead of being one of the program's detractors, I'm one of its supporters.
- 14% I do think that active first graders need to have P.E. Apparently, this conflicts with the science/Spanish program. Is there any way to ensure that students continue to receive P.E. as well as other enrichment activities?/ am disappointed that a specialty curriculum needed be deleted from the children's day to accomplish the program. I had thought they would not experience a change in their other activities outside of the normal switch of PE and music. /Why did they lose art?/It should not be at the expense of the other curriculum or of P.E. the children need exercise as well.
- 12% It would be nice to let the parents know what the teacher's goals are. Something concrete and measurable. /Learning the Spanish language should take more emphasis. Hopefully the science and hands-on will make the language more fun.
- 10% I was skeptical about having this program 4 times/week. It seems though that the frequency is the key to the program's success./ This program takes too much away from other subjects and classroom time. / Four times a week is too much.
- 8% The newsletter and "Make and Take" sessions were terrific. But the newsletter needs to provide information on what science concepts and skills are being taught. The fact that the sessions and newsletter focused only on language instruction and not on science concepts reinforced the parents' perception that science instruction was getting lower priority than Spanish instruction.

APPENDIX E

PARENT PARTICIPATION

Date	Event	Location	# Attending
2/12/96	Parent Meeting/Workshop	Ciencias lab	25
3/5/96- 3/7/96	Spanish Classes for Adults	Herod Cafeteria	11 +
4/11/96	Make and Take Workshop	Ciencias lab	15
4/18/96	Parent Advisory Committee	Ciencias lab	6
5/12/96	Gifted and Talented Parent Introduction to the school	Herod Cafeteria	50
5/12/96	Gifted and Talented Parents of Prospective students Visited Ciencias lab	Ciencias lab	25
5/23/96	Parent Advisory Committee	Ciencias lab	6

Information compiled from Parent Sign-in sheets
 + = Other adults were also taking the Spanish class

APPENDIX F
MONTHLY NEWSLETTER

Ciencias en Español

Volume #1 Issue #5

May, 1996

"Students learn to use their analytical thinking to acquire meaning."

Kindergarten and 1st Grade students were post tested for Spanish language comprehension and the results show tremendous growth in receptive language for only three months of study. This is the first step towards acquiring a second language. Students in an immersion type program learn to use their analytical thinking to negotiate meaning.



Results of the Parent, Teacher, and Student Surveys

Enclosed with this Newsletter you will find an initial report, submitted by our Research and Evaluation Specialist of findings on the three surveys. The actual surveys cannot be disseminated. It is HISD policy to consider all survey material as confidential information, unless it is accompanied with a release form. Therefore, only the report may be distributed for all to read.



Teaching Foreign Language to Young Children

(From TFLA BULLETIN Spring 1996)

"Just as there are many theories and ideas about the teaching of reading and mathematics, there are many theories and ideas about the teaching of foreign languages to young children. Most of the methodology revolves around repetition in a variety of ways, the use of TPR, the involvement of the children in real-life situations (or simulated real-life situations which are age-appropriate), the use of interdisciplinary and cultural activities, many visuals, songs, dances, skits and conversations, and many personalized activities. Many of these activities revolve around the N.L.K.T. approach (the Native Language Kid Talk approach) which helps empower students to converse on topics which are normally of interest to them. Each of the approaches and activities can contribute to the achievement of the goals of the program. There is no one best way, but there are a variety of ways which will benefit children, and which will 'fit' into a longer sequence."



"Hay que regar y cuidar lo que hemos plantado...." (We must water and take care of that which we have planted....)



"De esa manera habrá buen fruto que cosechar...." (That way there will be good fruit to harvest....)

Summer "Home Spanish Review"

I am attaching a list of vocabulary words to which the students were exposed in the lab. If you go camping, to the Zoo, to a museum, or to the beach, and you come across one of these things,

you might want to review the words pointing to things and making a game out of the activity. Just have fun!



¡Que disfruten del verano!
Have a happy summer!

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